

THE INFORMATIONALLY CONSTRAINED ANALYST:
THE IMPACT OF INFERENTIAL BELIEFS ON
ANALYSTS' DECISION PROCESSES

By

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Abstract of Dissertation Presented to the Graduate School
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This study focuses on financial analysts' decision-making processes when predicting future financial data when firm-specific information is absent. Three hypotheses concerning inference making were examined using financial analysts within a sales prediction task where the prior-period relationship between intra-industry firms and the consistency of forecasted information were manipulated. In addition, written protocols were gathered and analysts completed a survey which provided additional evidence on inference making.

The results indicate that forecasted information provided by intra-industry firms had a significant effect on analysts' sales predictions. Empirical evidence indicates analysts appeared to engage in an averaging form of inference making when inconsistent information was available. Analysis of written protocols confirm this effect and indicate that a similar effect took place when information was consistent. Although the

experiment did not confirm the hypothesis that the *strength* of the relationship between historical information of intra-industry firms affects an analysts' prediction of sales, survey results and written protocol analysis indicate analysts do use a firm's historical data and information from other firms within an industry to infer absent information. Empirical results also indicate that analysts were less confident in their sales prediction when the prior-period relationship was weak as opposed to strong. Analysts were, however, no less confident in their sales prediction when forecasted information was inconsistent rather than consistent.

CHAPTER 1 INTRODUCTION

Analysts are among the primary users of financial accounting information. An analyst integrates financial accounting information with other sources of information to produce various outputs. Forecasts are examples of these outputs. Forecasts provide input to the decision problems of others. For example, analysts' forecasts are used by investors in making buy/sell decisions.¹ Management may use analysts' forecasts to determine "target" earnings or in making disclosure decisions.² Audit firms sometimes use analysts' forecasts as an analytical procedure to detect possible earnings management.³ Finally, accounting researchers use analysts' forecasts as a proxy for market earnings expectations.

The financial analysts' prediction task is a complex judgment task in which analysts integrate diverse sources of information and make a prediction about the likelihood of some future event. The primary focus of this study is to examine the decision processes of

¹Individual investors consider analyst reports among the most influential sources of information for investment decision-making (Hirst et al. 1995).

²The information that analysts seek and use comes from a variety of sources, with firm management considered a primary source (AIMR 1993). Managers periodically disclose information to comply with mandated institutional standards (e.g., SEC, FASB, IRS). Yet, not all information is disseminated by managers to analysts through *mandated* standards, and managers determine which private information to *voluntarily* disclose. A manager's incentive to disclose or withhold information is motivated in part by investors' expectations in the absence of the information (Verrecchia 1983). In addition, when earnings appear to fall short of earnings forecasts, managers may disclose bad news to lessen the negative "earnings surprise" (Skinner 1994).

³One incentive for managers to manipulate earnings is to meet analysts' earnings expectations.

financial analysts in a limited information setting in which the “informationally constrained” analyst does not receive information that is sought for the purposes of predicting earnings (or components of earnings). The specific context examined is one in which the information sought by the analyst is privately held by management and management’s decision to disclose the information takes place in a “voluntary” rather than “mandated” disclosure environment. It is hypothesized that, within this context, analysts will engage in inference making. I examine necessary conditions for inference making to take place (Dick et al. 1990) and investigate the significance of intra-industry relationships as an alternative source of information that serves as a potential proxy for the absent data. It is further hypothesized that (1) strong intra-industry, prior-period relationships⁴ and (2) the “consistency”⁵ of predicted values of the absent data affect the decision outcome when financial analysts engage in inference making during the decision-making process.

The remainder of this dissertation is organized as follows. Chapter 2 reviews the previous literature on inference making. Chapter 3 presents the hypotheses. Chapter 4 describes the method used for testing the hypotheses. Chapter 5 presents the results of the experiment. Chapter 6 summarizes the results and describes the study’s contributions to existing research as well as its limitations.

⁴In the interest of parsimony, the term “prior-period relationship” will be used throughout the paper in lieu of “intra-industry, prior-period relationship.”

⁵See Chapter 3 for a definition of the term “consistent.”

CHAPTER 2

REVIEW OF LITERATURE

Inference making is broadly defined as drawing conclusions by reasoning from known facts or evidence. In this broad sense, all financial analysts engage in inference making during the decision-making process. Gonedes (1971, p. 321) states: “An investor’s expectations evolve via an inferential process that is predicated upon the investor’s present empirical knowledge.” Analysts, as investors, are therefore presumed to engage in inference making. Little evidence, if any, exists to support this presumption. Gonedes (1971 p. 322) also states: “The message emitted by the accounting process *may* affect investors’ actions by affecting their expectations via the perceptual process.” (emphasis added). An objective of this research is to determine whether messages emitted by the accounting process affect analysts’ decision-making process via an inferential process. Inference making is more specifically defined for the purposes of this study as the act of estimating a specific value for missing data and incorporating that value as an information cue in the decision-making process.

Accounting is an interesting institutional setting for the study of inference making and its effect on investor’s expectations. Research on inference making in accounting is limited but research on information transfer and financial analysts’ decision-making processes does exist. Previous research in inference making has been undertaken in the consumer behavior setting which is similar, in certain respects, to the accounting setting.

An analyst's evaluation of a firm and forecast of future value has some parallels with a consumer's evaluation of a product and a decision concerning a purchase of that product. The hypotheses, therefore, evolve from previous research in consumer behavior integrated with the results of accounting research on information transfer and financial analysts' decision-making processes. A contribution of this study to both the accounting and consumer behavior literature is the application of a consumer behavior model to an accounting setting.

General Model of Product Evaluation

Initial research in consumer behavior considered overall product evaluation.^{1,2} A general model of evaluation is an averaging model

$$E = \frac{\sum_{i=1}^p w_i Y_i}{\sum_{i=1}^p w_i}$$

where E is the overall evaluation of a product with p information cues *present*. The

¹Examples include: satisfaction with a university course (Yates et al. 1978), ratings of restaurants (Meyer 1981), likelihood of purchasing beer (Huber and McCann 1982), desirability of candidates for a secretarial position (Yamagishi and Hill 1983), expected satisfaction with beef (Levin et al. 1984), satisfaction with purchase of 19" television (Johnson and Levin 1985), attitudes toward political candidates and banks (Jaccard and Wood 1988), and overall reaction to specific automobiles (Lim et al. 1988).

²In addition to overall product evaluation, researchers in marketing have also considered the inference-making process as it pertains to consumers' product choices (Meyer 1981, Ross and Creyer 1992, Broniarczyk and Alba 1994a,b).

information cue (Y_i) is subjectively weighted (w_i). As stated, the model does not specifically include information cues that are not presented but inferred.

Yamagishi and Hill (1983) expanded the basic averaging model to integrate both presented and absent information by considering product evaluation to be a function of "important" information rather than "presented" information only. The expanded model is

$$E = \frac{\sum_{i=1}^p w_i Y_i + \sum_{j=1}^n w_j Y_j}{\sum_{i=1}^p w_i + \sum_{j=1}^n w_j}$$

where Y_j are the n inferred information cues and $p+n$ is the total number of information cues deemed important (whether presented or not).

The effect of the inference-making process on the evaluation of the product takes place through the determination of a value for Y_j in addition to its subjective weighting.³ The model also accounts for the effect of absent information on the product evaluation when a specific value for Y_j is not determined. Suppose an information cue (Y_j) is deemed important but the decision maker does not infer a specific value for the cue. The value of that information does not appear in the numerator, yet the product evaluation is affected through the inclusion of the cue's weight in the denominator. Thus, this model allows for the decision maker to discount an alternative when important information is absent, yet

³It should also be noted that the addition of information cues with weights $j=1 \dots n$ may result in a change in the p weights of the presented information cues and consequently, the evaluation.

not infer a value for the absent information. It is therefore possible that an analysts may, in specific contexts, choose *not* to infer a value for absent information.

Integrative Model of Inference Making

Dick et al. (1990) present an integrative model of inference making that predicts an inference will be made when 1) the absence of data is noted, 2) an inference rule is accessible in memory, 3) inputs to the rule are also accessible, and 4) the consumer (decision maker) believes the inference rule will yield diagnostic and reliable conclusions. The Dick et al. model evolved over time on the basis of results of experiments reported in consumer behavior literature and is supported by recent results from that literature.

Salience of Absent Data

Experimental results from Simmons and Lynch (1991) and Sanbonmatsu et al. (1992) confirm that a necessary condition for information to be noted as missing (by consumers) is its importance. In accounting research, protocol analysis by Bouman et al. (1987) and Anderson (1988) and eye movement analysis by Hunton and McEwen (1996) indicate that analysts limit and/or focus their information search to those items considered “important” to the earnings prediction task. Thus, one necessary condition leading financial analysts to engage in inference making is that the absent data being sought is perceived to be important to the decision.

Inference Rules: Consumer Research

Marketing researchers have conducted various experimental studies in an attempt to ascertain the sources of information and the manner in which information is used when inference making takes place. In that line of research, the sources of information

considered when an attribute⁴ for a specific brand of product (denoted the target brand) was absent included (1) information pertaining to other attributes of the target brand and (2) information pertaining to the absent attribute in other brands within the product class.

Figure one, panels A through D, illustrates and summarizes the consumer behavior literature where 1) Y is the missing attribute of the target brand, 2) y_j are j other presented attributes for the target brand, 3) X^k is the value of the target attribute for the k th brand, and 4) x_j^k are j other product attributes for the k th brand.

Considering information about other attributes within the target brand implies the use of evaluative consistency--inferences based on evaluative implications of known information (Ford and Smith 1987, Dick et al. 1990, Simmons and Lynch 1991, Sanbonmatsu et al. 1992, Broniarczyk and Alba 1994a, b). If the presented attributes (y_1, y_2, \dots) are above (below) average, the absent attribute (Y) is assumed to be above (below) average. Figure 1, panel A illustrates this relationship.

As it is unlikely that evaluation of a product takes place without reference to other brands within the product class, the value of the attribute across alternative brands (X^k) another source of information for inference making. Research by Meyer (1981), Dick et al. (1990), and Ross and Creyer (1992) indicates that the value of an absent attribute may be inferred as a function of the average of the value of that attribute across the brands. Figure 1, panel B, illustrates this relationship.

⁴The term product "attribute" is synonymous with the usage of the term "information cue."

Panel A: Across attributes, within the alternative. Reliance on evaluative consistency

	<u>Attributes</u>
Target brand	<div style="border: 1px solid black; display: inline-block; padding: 2px;"> $y_1, y_2, \dots, y_i, \dots$ </div> Y

Panel B: Within attribute, across alternatives. Reliance on base rates

<u>Brands</u>	<u>Attributes</u>
Brand 1	x_1^1, x_2^1, \dots <div style="border: 1px solid black; display: inline-block; padding: 2px;">X^1</div>
Brand 2	x_1^2, x_2^2, \dots <div style="border: 1px solid black; display: inline-block; padding: 2px;">X^2</div>
	\vdots <div style="border: 1px solid black; display: inline-block; padding: 2px;">\vdots</div>
Target brand	y_1, y_2, \dots Y

Y: target attribute

y_j : other product attributes for the target brand

x_j : other product attributes for other brands

X: target attribute for other brands

Figure 1
Absent Attribute Information and Inference Relationships
Previous Research in Consumer Behavior

Panel C: Across attributes, across alternatives. Reliance on correlational cues

<u>Brands</u>		<u>Attributes</u>
Brand 1	$x1^1, x2^1, \dots$	$\begin{bmatrix} xi^1 & X^1 \end{bmatrix}$
Brand 2	$x1^2, x2^2, \dots$	$\begin{bmatrix} xi^2 & X^2 \end{bmatrix}$
	\vdots	\vdots
Target brand	$y1, y2, \dots$	$\begin{bmatrix} yi & Y \end{bmatrix}$

Panel D: Within the attribute, across time. Reliance on past realizations

	<u>Attributes</u>			
	<u>Current Time Period</u>		<u>Time = -1</u>	<u>Time = -2</u> ...
Target brand	$y1, y2, \dots$	yi, \dots	Y	$y1, y2, \dots$ $\begin{bmatrix} Y \end{bmatrix}$ $y1, y2, \dots$ $\begin{bmatrix} Y \end{bmatrix}$...

Y: target attribute

yj: other product attributes for the target brand

xj: other product attributes for other brands

X: target attribute for other brands

Figure 1--continued

However, Yamagishi and Hill (1981), Huber and McCann (1982), Ross and Creyer (1992), and Broniarczyk and Alba (1994a, b) have examined the *relationship* between attributes and their effect upon the inferred value by specifically considering their correlation. In general, the inferred value of an absent attribute (Y) is a function of the correlation between the absent attribute's value in other brands (X^h) with another attribute of those brands (x^h) and the value of a corresponding attribute of the target brand (y_i). Broniarczyk and Alba (1994b) extended this research by considering the specific attributes that are used in the correlational/inference-making process. By manipulating the empirical correlation and intuitive relationship between attributes, they found that theoretical correlations are given more weight than data driven correlations.⁵ Figure 1 panel C, illustrates this relationship.

Only recently have consumer behavior researchers considered historical data as a source of inference making. Broniarczyk and Alba (1994b) in seeking to determine potential boundary conditions for their findings that theory-based cues were dominant over data-based cues, examined whether the intuitive relationship could withstand the effects of contradictory historical performance of the attribute within the target brand (Y in past time periods). Their results showed that it did not, implying that the presence of historical data is influential.⁶ Figure 1, panel D, illustrates this relationship.

⁵The term *theory* is used to refer to consumers' intuitive beliefs about likely relationships, whereas *data-based* refers to empirical relationships.

⁶Product reputation was created by providing historical descriptions of the products over three years. Previous research had indicated that individuals intuitively form a positive relationship between durability and warranty. One of three products (the target product) was given the highest historical durability in the study phase of the experiment. In the test phase the subjects were given warranty and

Inference Rule: Proposed Research

Consumer behavior research has hypothesized and tested a number of inference rules used by consumers in making product evaluation and choice decisions. I integrate that research with research on decision making by financial analysts to hypothesize an inference rule appropriate to the earnings prediction task. My research contributes to research on inference making by considering inference rules that should be accessible in memory when a *financial analyst* makes decisions. Recent research into information transfer indicates that significant price movements of nondisclosing firms takes place when one firm in an industry group discloses (Baginski 1987, Pownall and Waymire 1989). In addition, one firm's disclosure causes investors to update their assessment of another firm (Schipper 1990, Dye and Sidhar 1995). These studies provide evidence that inference making may take place in an accounting context. These studies are not definitive, in that they have not shown a causal relationship between inference making and information transfer. However, since financial analysts are trained to make comparisons of firms with similar characteristics within an industry (AIMR 1993), I consider intra-industry relationships to be an important source of information for financial analysts and inference making as a possible mechanism that facilitates information transfer.

In addition, accounting information is presented in a multi-period framework. Even if the analyst does not have access to current period firm-specific data, past

asked to infer durability. The target product in the test phase had the lowest warranty, yet three quarters of the subjects assigned the target product the highest durability consistent with the effect of historical performance overriding the intuitive relationship between warranty and durability.

realizations of the information are available for both the target firm and other firms within the industry. A strong prior-period relationship between firms indicates firms tend to move together throughout time. Thus, changes to the environment (e.g. changing technologies, a new entrant in the market, a change in product demand) are assumed to be reflected in a similar manner in each firm. An inference drawn on this information is highly diagnostic.⁷ Thus, the hypothesized inference rule used by analysts to determine the value of absent firm-specific data is the following::

Given an analyst has recognized and determined a prior-period relationship exists between the target firm⁸ and another firm within the industry (denoted $r(Y_i X_i)$), and that relationship is "strong,"⁹ the analyst will extrapolate from that relationship, using a current-period information cue from the related industry firm (X_0) to infer a predicted value for the absent firm-specific information for the target firm ($P(Y_0)$).

$$P(Y_0) = f [r(Y_i X_i) , X_0]$$

Refer to figure 2 for an illustration of the extent to which the hypothesized inference rule integrates and expands the consumer behavior research.

Evidence of Spontaneous Inference making

There is some concern that individuals do not spontaneously engage in inference making. Most studies in consumer research involved the effects of inference making on

⁷Information that is diagnostic is not necessarily right or wrong. The prediction task takes place under conditions of uncertainty. It is certainly possible that even though the firms moved together in the past, they will not move together in the future. What is important is the analysts' perception of the future relationship among the firms.

⁸A target firm is a firm for whom an analyst is making an earnings prediction and current-period, firm-specific information is absent.

⁹The term "strong," while subjective in nature, could mean a high empirical correlation or an appropriately high r^2 from a regression analysis.

Information Cues

<u>Firm</u>	<u>Current Time Period</u>		<u>Time = -1</u>		<u>Time = -2</u>	
Industry firm 1	$x1^1, x2^1, \dots$	X_0^1	$x1^1, x2^1, \dots$	X^1	$x1^1, x2^1, \dots$	X^1
Industry firm 2	$x1^2, x2^2, \dots$	X_0^2	$x1^2, x2^2, \dots$	X^2	$x1^2, x2^2, \dots$	X^2
	:	:	:	:	:	:
Target firm	$y1, y2, \dots$	Y_0	$y1, y2, \dots$	Y	$y1, y2, \dots$	Y

Y: target information cue

yj: other information cues for the target firm

xj: other information cues for other firms within the industry

X: target information cues for other firms within the industry

Figure 2
Absent Attribute Information and Inference Relationships
Hypothesized Inference Rule for Financial Analyst Predictions

consumer product evaluations and specifically prompted individuals to engage in inference making to determine its effects (Huber and McCann 1982, Dick et al. 1990, Broniarczyk and Alba 1994, Ford and Smith 1987, Limm et al. 1988, Sanbonmatsu et al. 1992, Ross and Creyer 1992).

Several studies "inferred" inference making had taken place if the marginal effect of changes in a presented attribute differed between completely and incompletely described brands when the presented attributes attractiveness was varied (Huber and McCann 1982, Johnson and Levin 1985, Lim et al. 1988, Yamagishi and Hill 1981). Simmons and Lynch (1991), however, proposed alternative explanations for the observed effect. The marginal (slope) effect could also be a consequence of a constant value inference with a change in attribute weighting, treating the absence of the attribute as a negative cue, or ignoring the absence of the information. Simmons and Lynch's (1991) experimental design controlled for these alternative explanations yet still failed to find strong evidence of inference making. In addition, both retrospective and concurrent protocols revealed only weak evidence of inference making.

The proposed research differs from that in consumer research in several respects. The subjects in this research are financial analysts skilled in making earnings forecasts on a regular basis. Subjects in consumer research were primarily students (Slovic and MacPhillamy 1974, Yates et al. 1978, Meyer 1981, Levin et al. 1984, Johnson and Levin 1985, Ford and Smith 1987, Lim et al. 1988, Simons and Lynch 1991, Sanbonmatsu et al. 1992, Ross and Creyer 1992, Broniarczyk and Alba 1994) and evaluations were made of consumer products such as televisions, cameras, refrigerators, and carpet cleaners.

Although efforts were made to enhance subject involvement in the task through payments, lotteries and gift-giving scenarios, the subjects were not engaged in a task that they performed on a frequent basis. Neither were the subjects experts on the product they were evaluating. One exception is Sanbonmatsu et al. (1992) where subjects were pretested to determine their knowledge of the product and classified as high knowledge or low knowledge subjects. High knowledge individuals were more likely than low knowledge individuals to recognize the absence of information in making a judgment.

The inference-rule in this research is based upon a relationship that is both data and theory-based rather than solely data-based. When Broniarczyk and Alba (1994) examined spontaneous inference making in the presence of theory-based cues they found that one half of their subjects engaged in spontaneous inference making.

CHAPTER 3 HYPOTHESES

Inputs to the Inference Rule: Hypothesis One

In proposing the following hypotheses, I make three assumptions: (1) the targeted firm-specific information is not available in the current period, (2) past realizations of the information are available for both the target firm (Y_t ; $t = -1, -2, \dots$) and at least one other firm within the industry (X_t ; $t = -1, -2, \dots$), and (3) the absent information is available for the other firm(s) within the industry for the current period ($t=0$). Another critical assumption underlying the hypotheses is the analysts' ability to discern a relationship between the target firm and other firms within the industry.¹

The first hypothesis is based upon the first three of the necessary conditions proposed by Dick et al. (1990) for inference making to take place in a consumer behavior context: 1) the absence of data is noted, 2) an inference rule is accessible in memory, and 3) the inputs to the rule are also accessible. These are combined with the specific proposed inference rule and characteristics of the financial analyst earnings forecast decision making context. Inference making is supported when a change in earnings prediction occurs as a result of changes in the inputs to the inference rule.

¹The analysts' ability to discern a relationship does not pertain to the analysts' ability to determine a specific numerical correlation, but rather to recognize whether a paired series of numbers exhibit high or low correlation and thus a correspondingly "strong" or "weak" relationship exists.

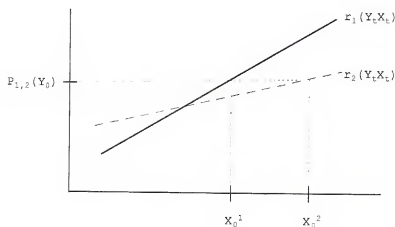
- H1: Financial analysts engage in inference making when firm-specific absent data is important and there exists a strong prior-period relationship with an intra-industry firm. When current-period data disclosed by the intra-industry firm differs, financial analysts' forecasts will differ. Forecasts should not differ when the prior-period relationship is weak, *ceteris paribus*.

Reliable Conclusions

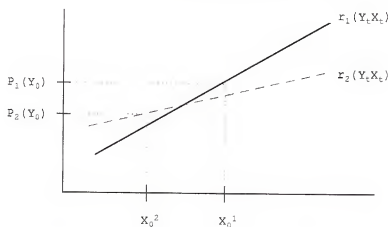
Hypothesis Two

The fourth condition of inference making by Dick et al. (1990) is that the decision maker believes the inference rule to yield diagnostic and reliable conclusions. The diagnosticity of information has been addressed earlier (p. 12). I consider reliable conclusions to be of concern in the context within which the decision maker infers multiple values for the absent data. The "consistency" of inferred values for the absent information is pertinent when more than one firm within the industry exhibits a strong prior-period relationship with the target firm. Refer to the bottom of figure 3. Let the solid line represent the prior-period relationship of the target firm with firm one $[r_1(Y_i, X_i)]$ and the dashed line represent the prior-period relationship with firm two $[r_2(Y_i, X_i)]$. The current-period data for firm one (X_0^1), along with its' prior-period relationship $[r_1(Y_i, X_i)]$, implies a predicted current-period value for the target firm of $P_1(Y_0)$. The current-period value for firm two (X_0^2), along with its' prior-period relationship $[r_2(Y_i, X_i)]$, implies a predicted current-period value for the target firm of $P_2(Y_0)$. The predicted value cues are "inconsistent" when the predicted value for the target firm on the basis of firm one differs from the predicted value for the target firm on the basis of firm two $[P(Y_0|r_1(Y_i, X_i), X_0^1) \neq P(Y_0|r_2(Y_i, X_i), X_0^2)]$. The inconsistency may arise as a consequence of an event that took

**"Consistent" Predicted Values of Absent
Firm-Specific Data**



**"Inconsistent" Predicted Values of Absent
Firm-Specific Data**



$r_t(Y_t X_t)$: prior-period relationship of firm Y with firm Xⁱ.

X_0^i : current-period data of firm Xⁱ

$P_i(Y_0)$: predicted current-period value for firm Y given $r_t(Y_t X_t)$, X_0^i

Figure 3
Consistent and Inconsistent Predicted Values of Absent Firm-Specific Data

place in the current (or immediate past) period that affected each of these firms differentially. It may also result from managements' decisions to differentially disclose place in the current (or immediate past) period that affected each of these firms privately held information about immediate past or predicted future events. Thus, the analyst receives conflicting information in that the predicted value of the absent information differs.

On the other hand, refer to the top of figure 3. The inferred value of the target firm given the prior-period relationship with, and current-period value of, firm one $P_1(Y_0)$ does not differ from the inferred value given the prior-period relationship with, and current-period value of, firm two $P_2(Y_0)$ [i.e. $P(Y_0|r_1(Y_t, X_t), X_0^1) = P(Y_0|r_2(Y_t, X_t), X_0^2)$]. I define these as "consistent predicted values" and hypothesize that analysts will infer a value for the absent data within this context.

- H2: Financial analysts will engage in inference making when prior-period relationships are strong and predicted values are consistent. Thus, when current-period data disclosed by the intra-industry firms differs, financial analysts' forecasts will differ. Forecasts should not differ when the prior-period relationship is strong and the predicted values are inconsistent, *ceteris paribus*.

Hypothesis Three

It is possible that the analyst may seek to resolve the inconsistency by inferring a value for the absent information using the proposed inference rule, however, it is unlikely that they will do so. Inferring a value of the absent information, by itself, involves risk-taking on the part of the analyst and the increased uncertainty in that value caused by inconsistent predictions will increase the risk to the extent that inference making using this

rule will not take place. As the absent information for which a value is being determined is just one input into the analysts' forecast decision, a forecast will nonetheless be made by the analyst even though predicted values are inconsistent. It is predicted, however, that the analysts' confidence in the forecast will be not be as great as it will be when predicted values are consistent.

- H3: When prior-period relationships are strong and predicted values are consistent, financial analysts' confidence in their forecasts will be greater than when the predicted values are inconsistent, *ceteris paribus*.

To summarize, it is predicted that within the decision making context of financial analyst earnings prediction, spontaneous inference making takes place. To provide evidence that spontaneous inference making occurs, a specific context is examined in which the absence of data is noted and an inference rule that yields diagnostic and reliable conclusions is accessible in memory. Inference making is supported when a change in earnings prediction occurs as a result of changes in the inputs to the inference rule. The hypotheses will be tested as described in the next chapter.

CHAPTER 4 METHODOLOGY

An experimental methodology will be used to test the hypotheses of this study.

There are a number of advantages to using an experimental methodology for this research. An experiment, as opposed to an archival approach, allows the researcher to manipulate the variables of interest and control others. An additional advantage of the experimental method is the ability to present alternatives that do not currently exist in the environment.

Analyst inferences are examined within two voluntary disclosure environments. The first environment evolves from the recommendations for voluntary disclosure by the American Institute of Certified Public Accountants (AICPA) Special Committee on Financial Reporting (the "Jenkins Committee") (AICPA 1994) comprehensive model of business reporting. The Jenkins Committee model contains ten elements of information that the Committee deems useful to the decision maker. The Committee does not mandate, but rather recommends, the ten elements for disclosure. The second environment evolves from the recommendation of the Australian Society of Certified Practising Accountants (ASPCA) External Reporting Centre of Excellence report on management discussion and analysis. The Centre recommends the inclusion of four items of information to ensure comprehensive financial reporting.

In both environments, if the recommendations for disclosure are adopted by some firms and not others, a natural setting for inference making will evolve.¹ In these settings, the analyst, who seeks specific information about a target firm and finds that information absent, may find that same information disclosed for other firms within the industry. The recency of the Jenkins Committee and External Reporting Centre of Excellence recommendations limit the availability of actual firms who have adopted their reporting recommendations. Cases have been developed using the comprehensive business reporting recommendations, allowing a prospective, rather than retrospective, examination of the issue.

Survey

A survey was constructed to determine (1) the extent to which analysts seek specific information elements, (2) the availability of each of the information elements when it is sought, and (3) the importance of each of the information elements to the prediction of earnings. The information examined in the survey was selected from the ten elements of information recommended by the Jenkins Committee. The survey also provided an initial pretest of the inference-making process by asking the analysts to indicate the manner in which they make inferences when information is sought and found to be absent. The survey (see Appendix A) was mailed to 140 members of a local chapter of the Financial Analyst Society of the Association for Investment Management and Research (AIMR) in a large metropolitan city.

¹The salience of absent information should also be enhanced if analysts are aware of the Committee's recommendations and hence note that recommended disclosures are absent.

Results

Twenty-seven surveys were returned for a response rate of 20%. Five of the respondents indicated that they did not value a company's stock, resulting in 22 usable responses. The level of experience ranged from 2 to 49 years, with a mean level of 17 years of experience. Fifty percent were chartered financial analysts. Job titles ranged from portfolio manager to president and owner. Table 1 summarizes the subject data.

Ninety-one percent of the responding analysts made buy/sell recommendations and 55% indicated that they predicted earnings. Thirty percent made buy/sell recommendations on a daily basis, 35% at least once a week, 30% less than weekly but several times a month, and 5% infrequently. Of those who predicted earnings, 42% predicted earnings on a daily basis, 8% at least once a week, 33% less than weekly but several times a month, and 17% infrequently. The responses were analyzed for the sample as a whole and for the subsample of those who predicted earnings.² Although the sample size is small, it represents a highly experienced cross section of financial analysts.

One objective of the survey was to identify an information element that financial analysts deemed important, sought, and found absent. Table 2, panels A through C summarize these results. "The entities opportunities and risk, including those resulting from key trends" was deemed very important or important by 90% of the subjects in the full sample and 92% of the subjects in the earnings prediction subsample. Sixty-seven

²The range of experience for the earnings prediction subsample was 5 to 49 years with a mean experience level of 23 years. Eighty three percent of the subsample held certifications (e.g. chartered financial analyst, certified financial planner, certified public accountant)

TABLE 1
Subject Information
Survey of Financial Analysts

	Number of Financial Analysts
Predict Future Earnings:	
On a daily basis	5
At least once a week	1
Less than weekly but several times a month	4
Infrequently, less than once a month	2
Make Buy/Sell Recommendations:	
On a daily basis	6
At least once a week	7
Less than weekly but several times a month	6
Infrequently, less than once a month	1
Years Employed in This Profession (mean)	17
Specialize in a Particular Industry	4
Chartered Financial Analyst	11

Full sample, n=22

percent of the full sample and 75% of the earnings prediction subsample frequently sought that information. Fifty percent and 42%, respectively, indicated that the information is only sometimes or rarely available. In relation to the other information elements, this element ranked second (fourth) in terms of importance and second (first) in frequency sought, yet ninth (eighth) in availability in the full (earnings prediction) sample. "Management's plans, including critical success factors" were high in importance but sought occasionally. "High-level operating data and performance measures that management uses to manage the business" was cited as being rarely available but low in importance. In keeping with previous research "Financial statements and related disclosures" was third in importance, most frequently sought, and most available. The results of this portion of the survey indicate that the best element for testing the hypotheses is "The entities opportunities and risk, including those resulting from key trends."

My initial hypothesis, prior to the survey, was that *management plans* were important, sought, and found absent. Thus, the questions pertaining to inference making in the survey pertained specifically to management plans. Respondents were asked to indicate any, and all, inference processes that they used when management plans were sought and found absent. In the full (earnings prediction) sample 52% (67%) indicated they would discount the stock's value because the information was missing. While 29% of the full sample indicated they would ignore the information, only 8% of the earnings prediction subsample indicated they would ignore the information. One-third of the respondents indicated they would make specific inferences. One-fourth of both samples

TABLE 2
Financial Analysts' Responses to Survey
Panel A

How often do you seek the following for use in valuing stock?	Ratings (in percentages)			
	Frequently	Occasionally	Rarely Because I Have Difficulty Obtaining the Information	Rarely Because I Do Not Find the Information Useful
Jenkin's Committee Ten Elements				
The entities opportunities and risk, including those resulting from key trends	67	29	5	0
The entities broad objectives and strategies	59	27	14	0
Financial statements and related disclosures	77	18	0	5
The scope and description of business and properties.	45	50	0	5
Management's plans, including critical success factors.	36	55	5	5
The impact of industry structure on the company	55	32	9	5
Comparison of actual business performance to previously disclosed opportunities, risks, and management's plans.	32	50	9	9
Management's analysis of financial and non-financial data	45	27	14	14
High-level operating data and performance measures that management uses to manage the business.	9	18	59	14
Information about managers and shareholders, including major transactions and relationships among related parties.	24	57	5	14

TABLE 2
Financial Analysts' Responses to Survey
Panel B

When you seek the following items of information, how available are they to you?	Ratings (in percentages)				
Jenkin's Committee Ten Elements	Always Available	Usually Available	Sometimes Available	Rarely Available	Never Available
The entities opportunities and risk, including those resulting from key trends	14	36	41	9	0
The entities broad objectives and strategies	32	45	18	5	0
Financial statements and related disclosures	64	27	9	0	0
The scope and description of business and properties.	50	27	23	0	0
Management's plans, including critical success factors.	9	45	36	9	0
The impact of industry structure on the company	32	36	23	9	0
Comparison of actual business performance to previously disclosed opportunities, risks, and management's plans.	9	50	27	14	0
Management's analysis of financial and non-financial data	18	45	32	5	0
High-level operating data and performance measures that management uses to manage the business.	5	14	36	45	0
Information about managers and shareholders, including major transactions and relationships among related parties.	23	41	27	5	0

Full sample, n=22

TABLE 2
Financial Analyst's Responses to Survey
Panel C

How important are the following items of information when valuing stock?	Ratings (in percentages)				
Jenkin's Committee Ten Elements	Very Important	Important	Somewhat Important	Somewhat Unimportant	Unimportant
The entities opportunities and risk, including those resulting from key trends	45	45	9	0	0
The entities broad objectives and strategies	36	59	5	0	0
Financial statements and related disclosures	73	9	14	5	0
The scope and description of business and properties.	52	29	19	0	0
Management's plans, including critical success factors.	41	45	9	5	0
The impact of industry structure on the company	36	36	18	9	0
Comparison of actual business performance to previously disclosed opportunities, risks, and management's plans.	32	36	23	9	0
Management's analysis of financial and non-financial data	23	32	27	18	0
High-level operating data and performance measures that management uses to manage the business.	18	32	32	18	0
Information about managers and shareholders, including major transactions and relationships among related parties.	14	36	36	14	0

Full sample, n=22

indicated they would use similar management plans from other firm's in the same industry to infer the absent information. Fourteen (twenty-five) percent indicated they would use the realization of similar management plans from the same firm's historical data to infer the absent information. Other responses included "Look for more information," "Question management's long term plans if the information is not available," and "Talk to competitors and suppliers." In summary, a majority of the respondents indicated the absence of the information would affect their valuation of a company's stock.

Hypothesis Testing

The hypotheses were tested using an experimental methodology. The design of the experiment for testing the first hypothesis was implemented as a 2×2 confounded block design.⁴ The design of the experiment for testing the second hypothesis was implemented as a 2×2 between-subjects experiment (see table 3). The independent variables were the prior-period relationship between the target firm (Y) and an industry firm (X^i) [denoted $r_i(Y, X_i)$ $i=1, 2, \dots$] and the current period value of the absent data for the industry firm (X_0). The dependent variables were a prediction of pulp and paper sales and confidence in the prediction.

Prior-Period Relationship

The prior-period relationship (strong/weak) is operationalized as the correlation between sales of a specific product segment (pulp and paper) for the target firm and an

⁴In a confounded block design the main effect is within subjects and the interaction effect is between subjects. The benefit of using such a design is the reduction in variance from the within subjects portion of the design.

TABLE 3
Experimental Design

Hypothesis One

Independent Variables		$r(X_i Y_i)$	
		strong	weak
X_0	3.5% price decline	cell 1 $S_{1 \dots n}$	cell 2 $S_{n+1 \dots N}$
	35% price decline	cell 3 $S_{n+1 \dots N}$	cell 4 $S_{1 \dots n}$

Hypothesis one was tested using a 2×2 fixed factor confounded block design where $r(X_i Y_i)$ is the prior-period relationship of firm Y (the target firm) with firm X (a competitor) and X_0 is the current-period data disclosed by firm X. The dependent variable is a prediction of 19x9 pulp and paper sales for the target firm.

Hypotheses Two and Three

Independent Variables		X_0^1	
		3.5% decline	35% price decline
X_0^2	3.5% decline	cell 1 (consistent) $S_{1 \dots n}$	cell 2 (inconsistent) $S_{n+1 \dots 2n}$
	35% decline	cell 3 (inconsistent) $S_{2n+1 \dots 3n}$	cell 4 (consistent) $S_{3n+1 \dots N}$

Hypotheses two and three were tested as a 2×2 fixed factor between-subjects design where the prior-period relationship of firm Y with firm X^1 is strong and X_0^1 is the current-period data of firm X^1 . The dependent variables are 19x9 pulp and paper sales and the financial analysts confidence in their 19x9 pulp and paper sales forecast for the target firm, the industry firm (X_0). The dependent variables were a prediction of pulp and paper sales and confidence in the prediction.

intra-industry firm during eight prior periods (table 4). In all conditions the intra-industry firms are described as being similar in size to the target firm with the specific product segment sales comprising fifty percent of total sales. The firm segment sales are taken from actual firms within the paper and forest products industry.⁵ Correlations of .926 and .818 correspond to firms with a strong prior-period relationship, whereas a correlation of -.073 corresponds to the firm exhibiting a weak prior-period relationship with the target firm.

Current-Period Value

Current-period value is operationalized as expected 19x9 sales of market pulp as disclosed by the intra-industry firm (table 4). Disclosure takes place in the form of "opportunities and risks including those resulting from key trends"⁶ for the paper and pulp segment. Two trends are disclosed by the related industry firm(s). The first, an opportunity, predicts growth in unit sales for pulp and is the same in all conditions. The second, a risk, predicts falling prices for market pulp in the upcoming years. Two levels of this variable consist of either a 3.5% price decline or a 35% price decline in 19x9. While seemingly drastic, the actual price of market pulp dropped 35% during the first quarter of

⁵Intra-industry firm segment sales were linearly transformed to be of similar magnitude to the target firm. In addition, firm segment sales for experiment one were linearly transformed in a manner that resulted in the immediate past period sales being nearly identical. This was necessary to distinguish between differences in EPS arising from the possible use of a time-series prediction model in which expected next period sales are current period sales and differences in EPS arising from the manipulated independent variable (prior-period relationship = strong/weak).

⁶These fall under the more general heading of forward-looking information in the United States and future-oriented information in Australia. A definition of forward-looking (future-oriented) information was also provided in the case materials.

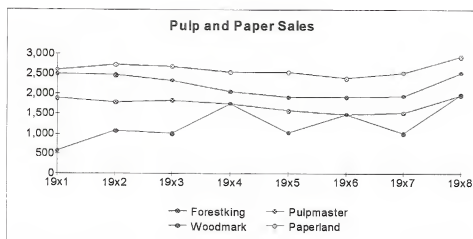
TABLE 4
Stimulus Material
Independent Variables

Prior-Period Relationship $r(X_t, Y_t)$

Sales of pulp and paper (\$ in millions)

Independent Variable $r(X_t, Y_t)^*$	Company	19x1	19x2	19x3	19x4	19x5	19x6	19x7	19x8
target Y_t	Forestking	2,499	2,491	2,329	2,071	1,930	1,921	1,942	2,518
$r(X_t, Y_t) = .926$	Pulpmaster	1,905	1,806	1,848	1,749	1,602	1,488	1,539	1,971
$r(X_t, Y_t) = .818$	Paperland	2,612	2,732	2,684	2,552	2,554	2,396	2,524	2,932
$r(X_t, Y_t) = -.073$	Woodmark	585	1,078	1,024	1,749	1,036	1,488	1,015	1,978

* Participants were not given this column.



Current Period Value (X_0)

Expected 19x9 sales of pulp in tons (thousands) and dollars (millions)

Independent Variable X_0	Pulpmaster & Woodmark	Paperland
$X_0 \approx 3.5\%$ price decline	590 @ \$892 = \$527	878 @ \$892 = \$783
$X_0 \approx 35\%$ price decline	590 @ \$601 = \$355	878 @ \$601 = \$528

1996, resulting in significant revisions of EPS (downward) by financial analysts who follow the paper and wood products industry.

Pulp sales are described as comprising 25% of sales within the paper and pulp segment and is consistent across conditions. The predicted effect on core earnings for the intra-industry firms is a \$3-\$5 million increase (3.5% price decline) or a \$14-\$21 million decrease (35% price decline).⁷

Participants and Sample Selection

Financial analysts were solicited to serve as participants in the experiment. In developing its comprehensive business reporting model the Jenkins Committee considered professional investors as a primary user of business reporting and cited as a main benefit of informative disclosure the reduced likelihood that analysts will misallocate their capital (AICPA 1994). Financial analysts are sophisticated investors who, “through financial analysis, form opinions about the absolute and relative value of individual companies, make investment decisions or cause them to be made, and thereby contribute to the economically efficient allocation of capital and clearing of the capital markets” (AIMR 1993, p. 1).

The financial analysts were recruited from two sources. In the United States, the analysts were recruited from the Association for Investment Management and Research (AIMR), 64% of whom hold the designation of Chartered Financial Analyst and 70% of

⁷Although pulp prices decrease 3.5%, an increase in core earnings is predicted from the predicted trend in growth of unit sales. The differing effects on core earnings for Pulpmaster (Woodmark) and Paperland are the result of the difference in 19x8 sales.

whom hold degrees beyond the baccalaureate. The AIMR is an active advocate of improved financial reporting as evidenced by its annual *Corporate Information Committee Report* which recognizes companies with awards for excellence in reporting practices and the recently released position paper *Financial Reporting in the 1990s and Beyond*.

In Australia, the analysts were recruited from the membership of the Securities Institute of Australia and the AIMR. The Securities Institute of Australia is the national not-for-profit professional organization representing people engaged in, and connected with, investment and securities markets in Australia. Members are admitted as either Associate or Affiliate members. Associate members are graduates of the Graduate Diploma in Applied Finance and Investment. Affiliate members are graduates of the Certificate in Financial Markets.

For the United States sample I obtained the 1997 membership directory of the AIMR which consists of over 27,000 members. The membership list identified individuals by industry classification, title and occupation, and industry specialty. From that list I selected individuals from two of the sixteen industry classifications--investment company/mutual fund (most likely buy-side) and broker-dealer, investment banking (most likely sell-side). I limited the forty-eight categories of title and occupation to six--credit analyst, equity analyst, financial analyst, portfolio manager, portfolio strategist, and quantitative research analyst. Industry specialty was limited to those individuals who did not identify themselves as specializing in a particular industry, one of the categories being generalist. The result was the selection of 1,163 potential participants. Five hundred and thirty were randomly chosen. Another three hundred and eighty potential participants

were chosen representing those individuals with membership in chapters in the state of Florida.⁸ This criteria was used in an attempt to increase response rate through name recognition with the University of Florida. No attempt was made to limit these individuals on the basis of industry classification, title and occupation or industry specialty.

For the Australian sample, members of the Securities Institute of Australia were identified from the April 1996 through March 1997 issues of JASSA, the professional journal of the Institute. The journal is published quarterly and includes a section identifying individuals admitted to membership and their firms. I selected those individuals in New South Wales and used the Sydney phone book to obtain addresses. Three hundred ninety two potential participants were identified. One hundred and eighty-two individuals were randomly selected. A further 76 individuals were added to the sample using the membership directory of the AIMR and consisted of all individuals from the Sydney Chapter, all Australians from the International Chapter, and all Australians identified in the section referred to as "no chapter affiliation." No attempt was made to limit these individuals on the basis of industry classification, title and occupation or industry specialty.

Materials

Participants were recruited through a letter describing the research project as dealing with corporate disclosure and investor decision-making processes. Potential participants were advised that the task would require approximately a half hour of time to

⁸Individuals in Jacksonville, Florida were not selected as they had participated in the survey.

complete. The task was administered in the form of a four page booklet, packaged with the previously described invitation to participate and a pre-addressed, postage paid reply envelope.

In the task materials the participants were presented with (1) an introduction informing them of the AICPA (ASCPA) recommendations for disclosure of forward-looking (future-oriented) information,⁹ (2) case instructions directing the participants to estimate pulp and paper sales for fiscal 19x9 for a fictitious company (Forestking) in the paper and forest products inventory,^{10, 11} (3) two cases, and (4) a questionnaire (see appendix B for a sample of the research instrument). Each case indicated that the target firm (Forestking) had not adopted the AICPA (ASCPA) recommendations for disclosure yet one or more competitors (cases 2 and 1, respectively) of the target firm had chosen to disclose the information. The competing firms were described as being approximately the same size as the target firm. The competitors' forecasts of opportunities and risks were

⁹The absent firm-specific data for the target firm was disclosure of opportunities and risks including those resulting from key trends. Survey results indicate analysts believe this information element to be important and frequently sought, yet available on a limited basis.

¹⁰The fictitious company, Forestking, was based upon Boise Cascade Corporation, an actual company within the paper and forest industry.

¹¹The pulp and paper industry was chosen since information transfer research by Pownall and Waymire (1989) indicated a significant coefficient for information transfer effects within this industry. In addition, a significant change in pulp prices (a 35% price decline) for the first quarter of 1996 took place. Firms with a December 1995 year end who released their reports during the first quarter of 1996 would have been aware of this information and could have chosen to disclose it as forward-looking (future-oriented). An examination of firms within the industry in both the U.S. and Australia indicated differential disclosure of this information across firms. Thus, the potential for inference making by investors existed at that time.

provided along with both a table and a graph¹² providing the target firms' and competitor(s) pulp and paper sales for the previous eight years (19x1-19x8). An estimate of fiscal 19x9 pulp and paper sales for Forestking and the analysts' confidence in their prediction (on a scale of 0-100%) were solicited at the end of each case. Analysts were also asked to provide a brief description of the decision-making process used. These descriptions provided a written protocol for additional analysis. Lastly, demographic and decision making questions followed the cases.

All individuals were advised that they and their firms would remain confidential and that they may request a copy of the results.

Predictions

Hypothesis one predicts that when the prior-period relationship is weak, there should be no difference in predicted pulp and paper sales for the target firm when the decline in pulp prices reported by an (the) intra-industry firm(s) is 3.5% versus 35%. When the prior-period relationship is strong, the predicted pulp and paper sales for the target firm when the decline in pulp prices are reported by an (the) intra-industry firm(s) to be 3.5% will be greater than when they are reported to be 35% (see figure 4). Therefore, a prior-period relationship by current-period value interaction is expected.

The case one conditions where the pulp price declines were consistent ($X_0^1 = X_0^2$) were used as the strong prior-period relationship condition and case two was used for the

¹²Hutchinson and Alba (1995) find that, in general, individuals enlist various heuristics and exhibit biases in determining correlations. Financial analysts, who are trained to determine and use correlations, should be less likely to exhibit these biases. However, to further insure that analysts recognized the prior-period relationship, the information was presented graphically.

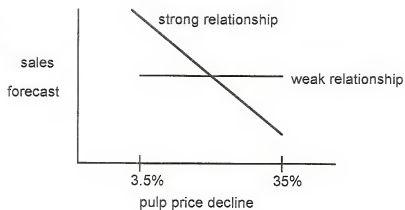
weak prior-period condition. Each subject received one of two pairs of cases. One pair of cases consisted of a case with a strong relationship and a 3.5% price decline and a case with a weak relationship and a 35% decline. The other pair of cases consisted of a case with a strong relationship and a 35% price decline and a case with a weak relationship and a 3.5% decline. Thus, the interaction effect was within subjects.

Hypothesis two predicts an interaction of consistency and current-period value. When the current-period values are inconsistent, there should be no difference in predicted pulp and paper sales for the target firm when the decline in pulp prices reported by the intra-industry firms are 3.5% or 35%. When the current-period values are consistent, the predicted pulp and paper sales for the target firm when the decline in pulp prices are reported by the intra-industry firms to be 3.5% will be greater than when they are reported to be 35% (see figure 4).

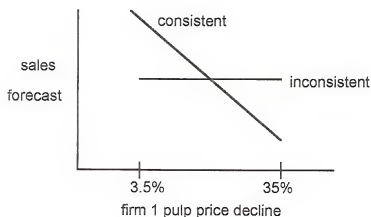
Hypothesis three predicts a main effect of consistency and no interaction effect. When the predicted values are consistent the analysts' confidence in their pulp and paper sales forecast should be greater than when the predicted values are inconsistent (see figure 4).

Hypotheses two and three were tested between subjects via case one. Hypothesis two was tested using the dependent variable of forecasted pulp and paper sales. Hypothesis three was tested using the dependent variable of self-reported confidence in the pulp and paper sales forecast.

Hypothesis One



Hypothesis Two



Hypothesis Three

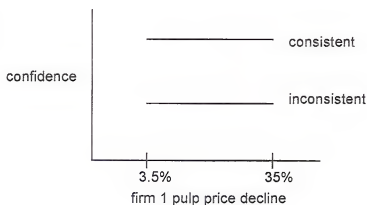


Figure 4
Predicted Results of Experiment for Each Hypothesis

CHAPTER 5

RESULTS

Forty-one experimental instruments were returned for a response rate of 4%.¹ Two of the respondents did not provide a sales prediction, resulting in 39 usable responses for testing the main hypotheses.² The level of experience ranged from 1 to 35 years, with a mean level of 12 years of experience. Thirty percent were from Australia and 70% percent from the United States. Sixty-six percent were chartered financial analysts (55% of United States respondents) or held a certificate in financial markets (92% of Australian respondents). Job titles ranged from analyst to CFO. Table 5 summarizes the subject data.

Since the survey identified "The entities opportunities and risk, including those resulting from key trends" as an information element that financial analysts deemed important, sought, and found absent, forward-looking information was chosen as

¹A low response rate is typical with this particular subject group. Several analysts either returned the research instrument, phoned, or e-mailed with a response that their company did not allow participation in research of this nature. Others indicated a willingness to participate but a lack of available time. In an earlier attempt to conduct the experiment via computer diskette in which potential participants were asked to return a postcard indicating their willingness to participate and receive a diskette, twenty-three percent returned the postcard. Of those, ninety-six percent responded that they did not predict earnings or did not have time to participate. Only four percent requested the diskette and none of those returned the completed diskette. The computer version of the instrument was also placed on a web site for access via downloading but none were returned from this medium. The "paper and pencil" instrument was designed reduce the time commitment of the analysts and increase response rate.

²The two individuals who did not provide a sales forecast for testing the main hypothesis did answer the post experimental questionnaire and were included in the analysis of those results.

TABLE 5
Subject Information
Survey of Financial Analysts

	Percentage of Financial Analysts . . .
Country:	
Australia	30%
United States	70%
Certification:	
certificate in financial management or certified financial analyst.	66%
Experience in the profession:	
1-9 years	52.5%
10-19 years	30%
more than 20 years	17.5%
Job title:	
portfolio manager	25%
director/manager of investments/ research	25%
V.P., president or CFO	18%
analyst	15%
other	17%
Predict future financial data as part of their employment.	78%
Do not specialize in a particular industry.	66%
Familiar with the pulp and paper industry.	15%
Familiar with actual fluctuation in pulp prices during the previous year.	10%

n=41

part of the experimental manipulation. Eighty-three percent of the respondents in the experiment ranked forward-looking information as important or very important, 68% sought forward-looking information frequently, and 63% found forward-looking information to be never, rarely, or sometimes available.

Tests of Hypotheses

Proposed Inference Rule (Hypothesis One)

Hypothesis one predicted a prior-period relationship by current-period value interaction. An ANOVA was performed with current-period data and prior-period relationship within subjects and the interaction between subjects. One observation was deleted after the written protocol revealed that the participant's sales estimate was inconsistent with their protocol (i.e. a calculation error had occurred). Panel A of Table 6 presents the ANOVA results and figure 5 provides a graphical illustration of the results. The predicted interaction was not significant. The main effect of current-period value was significant indicating that participants attended to the current-period value information whether the prior-period relationship was strong or weak. Thus, hypothesis one was not supported. An analysis of the written protocols in the weak prior-period relationship condition confirms this effect. It appears that analysts incorporated the intra-industry firm disclosure of future pulp prices into their decision in much the same manner as they would have incorporated an industry forecast of future pulp prices into their sales forecasts.

The lack of a strong prior-period relationship between the firms was however noted by several of the analysts in the weak condition. Statements such as "Woodmark has greater volatility than Forestking," "Woodmark information is of limited use, the trends

TABLE 6
Anova Results-main Effects and Interaction Effects
Hypothesis One

Panel A: Independent variable: sales forecast

Factor	MS	F	p
Prior-period relationship $r(X_t, Y_t)$	3606.82	0.09	0.7759
Current-period value X_0	874822.09	20.88	0.0013
Interaction $r(X_t, Y_t) \times X_0$	5149.72	0.03	0.8694

n=11

Panel B: Independent variable: confidence in sales forecast

Factor	MS	F	p
Prior-period relationship $r(X_t, Y_t)$	833.3	6.65	.0275
Current-period value X_0	75	.60	.4570
Interaction $r(X_t, Y_t) \times X_0$	635.3125	.21	.6567

n=12

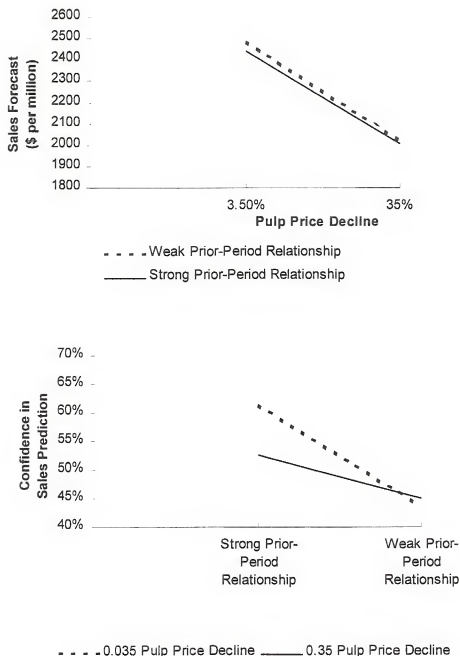


Figure 5
Results of Experiment for Hypothesis One

for Woodmark are more volatile,” “Woodmark is not correlated with Forestking,” and “Not as confident since data was not as comparable” were made.

On the basis of these comments, a second ANOVA was performed using confidence in the sales prediction as the independent variable. The results are reported in panel B of table 6 and figure 5. When the prior-period relationship was weak the analysts were significantly less confident in predicting sales than when it was strong. Thus, although hypothesis one is not supported regarding the use of current-value information in the presence of a strong/weak prior-period relationship, the analysts’ confidence in their sales prediction was effected by the strength of the prior-period relationship.

Reliable Conclusions (Hypotheses Two and Three)

Hypothesis two predicted a significant interaction of consistency and current-period value. Consistency is operationalized through equivalent current-period values for two intra-industry firms ($X_0^1 = X_0^2$). An ANOVA was performed with X_0^1 and X_0^2 as between subjects variables. Panel A of Table 7 presents the ANOVA results and figure 5 provides a graphical illustration of the results. Hypothesis two is supported by significant main effects of these variables and no interaction (model $p=.0001$; $R^2=.468$).³ The mean sales prediction varied significantly when current-period values were consistent (\$2,500 for a 3-5% pulp price decline, \$1,970 for a 30-50% pulp price decline). The mean sales

³Since firm, rather than consistency, was an independent variables, a significant main effect of the current-period values for each firm and no significant interaction is equivalent to a significant interaction of consistency and current-period value.

TABLE 7
Anova Results-main Effects and Interaction Effects
Hypotheses Two and Three

Panel A: Independent variable: sales forecast

Factor	MS	F	p
Current-period value of firm one X_0^1	282389.9	5.97	0.0198
Current-period value of firm two X_0	1225851.6	25.89	0.0001
Interaction $X_0^1 \times X_0^2$	40081.6	0.85	0.3638

n=39

Panel B: Independent variable: confidence in sales forecast

Factor	MS	F	p
Current-period value of firm one X_0^1	326.05	0.71	0.4046
Current-period value of firm two X_0^2	115.89	0.25	0.6181
Interaction $X_0^1 \times X_0^2$	15.23	0.03	0.8564

n=39

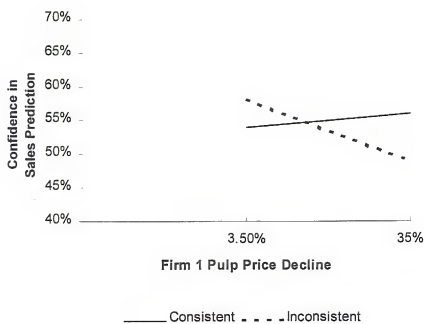
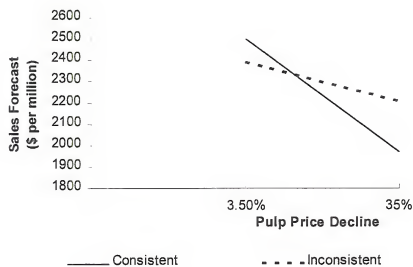


Figure 5
Results of Experiment for Hypotheses Two and Three

prediction did not vary significantly when current-period values were inconsistent (\$2,393 and \$2,207). Thus hypothesis two is supported.

Hypothesis three predicted a main effect of consistency and no interaction effect when the dependent variable is the analysts self-reported confidence in their pulp and paper sales forecast. Panel B of Table 7 presents the ANOVA results and figure 5 provides a graphical illustration of the results. Hypothesis three was not supported.

Additional Analysis

Additional Factors

An ANOVA was run for each of the models to determine whether results differed on the basis of several factors. The results were similar whether (1) individuals predicted, or did not predict, future financial data as part of their employment; (2) participants were from Australia or the United States; (3) individuals were familiar, or not familiar, with the pulp and paper industry prior to completing the study; or (4) individuals were familiar, or not familiar, with the actual pulp and paper prices during 1996.⁴ There was a difference for the results of hypothesis two and whether or not individuals were certified as a financial analyst or held a certificate in financial markets. The overall model was not significant ($F=2.63$, $p=.1144$) for those participants who were neither a CFA nor held a CFM. The written protocols revealed this result was primarily due to one experimental condition containing two participants, both of whom were also in

⁴In some cases the sample was not complete. For example, there were no individuals in one of the experimental cells who did not predict future financial data as part of their employment. It can be conjectured that individuals who do not predict future financial data would weaken the results. Yet, a comparison of those who did predict future financial data with the sample as a whole did not reveal significant differences in results.

the “inconsistent” condition and did not use any drop in pulp price in computing their sales prediction.

Important Information

Participants were asked to state the single piece of information they considered most important when making predictions of future sales, irrespective of the information given (not given) in the case material. Thirty-seven participants responded to this query. Of those, 30% cited price and/or cost information, 30% cited supply and/or demand information, 16% mentioned trends, 14% mentioned past sales, and 14% mentioned market share or market size.⁵ Also mentioned were industry data, management estimates, and unit volume growth rates. This provides further evidence that the information provided to the analysts was considered to be important to their sales prediction.

Management's Reason for Non-Disclosure

Participants were asked if, in their examination of the case materials, they considered the reason that management of the target company did not disclose the forward-looking information. Surprisingly, two-thirds of the respondents did not. Agency literature such as Feltham and Xie (1992) and Dye and Sridhar (1995) is predicated upon the investors beliefs in management's reason for nondisclosure (e.g. keep bad news from the market, keep good news from competitors). Of the fourteen participants who indicated they considered a reason for non-disclosure, 36% believed it was due to volatile sales and poor predictability, 36% believed the news was bad or would affect share price,

⁵Although, the analysts were asked for a *single* important piece of information, several analysts cited more than one. Thus the percentages total more than 100%.

and 29% believed it was due to competitive considerations. Other factors cited were privacy and the increased burden of additional disclosure.⁶

Inference making

Respondents were asked to indicate any, and all, inference processes that they used when forward-looking information they felt was important for predicting future financial data was sought and found absent. Only 2% indicated they would ignore the information in making their prediction. Eighty-eight percent indicated they would use similar information from other firms within the industry to infer the absent information and 76% indicated they would use the firm's historical data to infer the absent information. Fifty-four percent indicated they would seek other information such as industry information (55%), information on the economy (32%), and government information (18%). Ten percent replied that in the absence of the information they would talk to management.

Written Protocols: Use of Historical Data

Although a vast majority of the analysts indicated they would use similar information from other firms within the industry and/or the firm's historical data to make an inference when information deemed important for making a sales prediction was absent, it is important to determine if they did, in fact, do so. An analysis of written protocols was undertaken to attempt to determine the manner in which the analysts made their sales prediction.

⁶The percentages do not sum to 100 as some participants gave multiple reasons.

Two-thirds of the respondents either specifically mentioned using historical data or demonstrated that they used it in their calculations. As the research instrument was not designed to separate the effects of using the historical data of the target firm from those using the historical data of all three firms, it was difficult to determine precisely which was the case. However, it was evident from examining the protocols that at least 38% of those using historical data used both the data of the target and competitor firms. Some individuals calculated year to year changes in sales for all three firms, others calculated the target firms market share for the previous years, and some mentioned the trend in sales as depicted in the graph. Three individuals specifically mentioned the term "correlation" in their protocols. Twenty-three percent used only the historical data of the target firm. Some individuals calculated year to year changes while others mentioned the trend as depicted in the graph.

Written Protocols: Use of Intra-industry Firm Data

As noted above, some individuals specifically used *prior-period* intra-industry firm data in their sales predictions. Also available was the current-period intra-industry information disclosed in the form of a 19x9 pulp price forecast by the two competitor firms. Two individuals ignored this information. Both were in the condition in which inconsistent information was disclosed. Of those individuals in the consistent condition where a 2 to 5% pulp price decline was forecasted, 17% used a 5% decline in their sales prediction, representing a conservative use of the information. Fifty percent used an average 3.5% decline and 33% used an optimistic 2% decline. Of those individuals in the consistent condition where a 30-40% pulp price decline was forecasted, 11% used the full

40% price decline, 67% used an average 35% decline, 11% used a 30% decline. One individual used a less than 30% pulp price decline (13%). It was difficult to determine from the protocol how the individual arrived at the 13% estimate.

Of even greater interest is the decision-making behavior of those analysts in the inconsistent conditions where forecasted pulp price declines were 2-5% for one company and 30-40% for the other. As previously mentioned, two individuals in this condition chose to ignore the pulp price decline forecast. Of the remaining, one-third of the individuals used either the 30-40% price decline or the 2-5% price decline (an equal number chose each). Of the remaining two-thirds who chose a decline between the two extremes, one-third chose a pulp price decline that ranged from 8.5-12%, one-third chose 20% and another one-third chose 22.5-28%.⁷

⁷It is interesting to note that one individual assigned a 65% probability of the price dropping 35% and a 35% probability of the price dropping 3%.

CHAPTER 6 SUMMARY AND DISCUSSION OF RESEARCH

Summary of Results

The results indicate that forecasted information provided by intra-industry firms had a significant effect on analysts' sales predictions. This result provides evidence that forward-looking information (in particular opportunities and risks), identified as a primary information need of investors by the American Institute of Certified Public Accountants report "Improving Business Reporting-A Customer Focus. Comprehensive Report of the Special Committee on Financial Reporting," is relevant to analysts' decision-making processes. The report recommends disclosure of "... company-specific information for which management is often the best source." (AICPA 1994, p. 25). However, as the committee recommends rather than mandates disclosure of forward-looking information, company-specific information from management may not be available as a source of information to investors. This research provides evidence that although management may not choose to adopt the committee's recommendations, adoption of the committee's recommendations for disclosure of forward-looking information by other firms within the industry will still affect analysts' decision-making process. Thus, the research also provides evidence of intra-industry information transfer.

Empirical evidence from the study indicates analysts appeared to engage in an averaging form of inference making providing confirmation of consumer-behavior research

by Meyer 1981, Dick et al. 1990, and Ross and Creyer 1992. It also expands the evidence of inference making in consumer research by providing evidence that averaging within the attribute across alternatives is used in a prediction task by subjects with expertise in the field. Although the experiment did not confirm the hypothesis that the *strength* of the relationship between historical information of intra-industry firms affects an analysts' prediction of sales, survey results and written protocol analysis indicate analysts do use a firm's historical data. This is consistent with consumer-behavior research by Broniarczyk and Alba (1994b) which indicates that individuals attend to historical data during inference making. This evidence also confirms the AICPA special committee report's contention that users of accounting information "often analyze historical data in searching for the impact of . . . trends that are expected to continue. It is very useful if data about a company is prepared in a fashion that facilitates the identification and analysis of trends." (AICPA 1994, p. 23).

Although empirical results did not support the hypothesis that the strength of a prior-period relationship with an intra-industry firm determines whether current-period information from the intra-industry firm is used as a cue for inference making, results did indicate that analysts were less confident in their sales prediction when the prior-period relationship was weak as opposed to strong. This is an important finding in that it indicates support for the proposition that the strength of the prior-period relationship does have an effect on the decision-making process of analysts. A limitation of the experiment was the minimal number of alternative information cues that analysts could use to determine a sales prediction. Analysts appeared to consider the cues from the intra-

industry firms as industry-general, rather than firm-specific, cues. It is possible that in the presence of alternative cues, analysts would choose between alternatives on the basis of the reliability of those cues. The confidence measure may be indicative of a threshold for the choice of cues among alternatives. Therefore, if reliable alternative cues were available, analysts may choose those alternatives in the “weak”, but not “strong” prior-period relationship condition. Future research could address this issue.

The finding that analysts were no less confident in their sales prediction when forecasted information was inconsistent rather than consistent supports finding that the forecasted current-value information was viewed as an industry-general cue. In all cases concerning this hypothesis the prior-period relationships with the intra-industry firms were strong. Future research in which the prior-period relationship were weak or industry-general information were present may reveal a confidence/consistency effect.

Benefits of Research

Management may benefit from this research since the inferences analysts draw when managers fail to voluntarily disclose firm-specific information provides additional evidence concerning analyst expectations in the absence of information. This research provides evidence that analysts incorporate the information disclosed by other firms within the industry into their predictions of the sales of the firm who chose not to disclose the information. It may be beneficial for management who face the possibility that adverse industry conditions will be forecast by others to address the adversity and provide firm-specific characteristics that may indicate the extent to which they will or will not be affected in the future. Alternatively, disclosing positive information may also counteract

the effect of the adverse disclosure via the averaging process. However, this behavior by management may not be successful in future periods due to a reputation effect.

Management may also benefit from the report by analysts that in the presence of information disclosed by intra-industry firms, the majority of analysts did not consider management's reason for nondisclosure and only twelve percent of the analysts believed the reason for nondisclosure was that the news was bad or would affect share price.

Contributions to the literature on information transfer research results from specifically investigating a mechanism (i.e. inference making) that may be responsible for information transfer and the manner in which the transfer takes place. This research provides evidence that an averaging process is present during information transfer.

This study provides insights into analyst behavior concerning analysts' forecast bias. Recent capital markets research on analysts' forecasts has observed that analysts' forecasts are systematically biased (Debondt and Thaler 1990, Butler and Lang 1991, Ali et al 1992, Francis and Philbrick 1993, and Dreman 1995). One goal of the proposed research was to analyze factors that contribute to analysts' forecast bias. Analysts' behavior revealed a positive bias in that twice the number of analysts in the consistent conditions chose the lesser decline in pulp prices than chose the greater decline. However, the majority of the analysts chose an average in both the consistent and inconsistent conditions indicating that any positive bias in this context is not dominant among analysts.

Limitations of Research

A limitation of this research is that it specifically addresses the use of a singular prior-period relationship without consideration of the multitude of other information cues

available for the use of the analyst in the inference-making process. For instance, the analyst may use evaluative consistency or other relationships to determine an inferred value for the absent information. Another limitation was that the experimental instrument was not designed to provide information about management disclosed vs. intra-industry firm disclosed forward-looking information.

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APPENDIX A
SURVEY

SURVEY OF PROFESSIONAL INVESTORS

This survey deals with investor decision-making, primarily as it applies to those investors who value a company's stock.

A. As a part of your employment do you:

Predict future earnings?

circle: Yes or No

Make buy/sell recommendations?

circle: Yes or No

If either of your answers to part A are yes, indicate with a check how often you make these decisions.

PREDICT FUTURE EARNINGS

MAKE BUY/SELL RECOMMENDATIONS

_____ on a daily basis

_____ on a daily basis

_____ at least once a week

_____ at least once a week

_____ several times a month

_____ several times a month

_____ infrequently, less than once a month

_____ infrequently, less than once a month

If both of your answers to part A are no, please indicate the types of decisions you make, if any, regarding the valuation of a company's stock.

B. Please indicate, by circling the appropriate number, how often you seek the following for use in valuing stock.

1= Frequently

2= Occasionally

3= Rarely because I have difficulty obtaining the information

4= Rarely because I do not find the information useful

1. Financial statements and related disclosures	1	2	3	4
2. High-level operating data and performance measures that management uses to manage the business.	1	2	3	4
3. Management's analysis of financial and non-financial data.	1	2	3	4
4. The entities opportunities and risk, including those resulting from key trends.	1	2	3	4
5. Management's plans, including critical success factors	1	2	3	4
6. Comparison of actual business performance to previously disclosed opportunities, risks, and management's plans.	1	2	3	4
7. Information about managers and shareholders, including major transactions and relationships among related parties.	1	2	3	4
8. The entities broad objectives and strategies	1	2	3	4
9. The scope and description of business and properties.	1	2	3	4
10. The impact of industry structure on the company.	1	2	3	4

C. Please indicate, by circling the appropriate number, when you seek the following items of information, how available they are to you.

- 1= Always available
 2=Usually available
 3=Sometimes available
 4=Rarely available
 5=Never available

1. Financial statements and related disclosures	1	2	3	4	5
2. High-level operating data and performance measures that management uses to manage the business.	1	2	3	4	5
3. Management's analysis of financial and non-financial data	1	2	3	4	5
4. The entities opportunities and risk, including those resulting from key trends.	1	2	3	4	5
5. Management's plans, including critical success factors	1	2	3	4	5
6. Comparisons of actual business performance to previously disclosed opportunities, risks, and management's plans.	1	2	3	4	5
7. Information about managers and shareholders, including major transactions and relationships among related parties.	1	2	3	4	5
8. The entities broad objectives and strategies	1	2	3	4	5
9. The scope and description of business and properties.	1	2	3	4	5
10. The impact of industry structure on the company.	1	2	3	4	5

D. Please indicate, by circling the appropriate number, how important the following items of information are to you when valuing stock

- 1=Very important
 2=Somewhat important
 3=Important
 4=Somewhat unimportant
 5=Unimportant

1. Financial statements and related disclosures	1	2	3	4	5
2. High-level operating data and performance measures that management uses to manage the business.	1	2	3	4	5
3. Management's analysis of financial and non-financial data.	1	2	3	4	5
4. The entities opportunities and risk, including those resulting from key trends.	1	2	3	4	5
5. Management's plans, including critical success factors					
6. Comparisons of actual business performance to previously disclosed opportunities, risks, and management's plans.	1	2	3	4	5
7. Information about managers and shareholders, including major transactions and relationships among related parties.	1	2	3	4	5
8. The entities broad objectives and strategies	1	2	3	4	5
9. The scope and description of business and properties.	1	2	3	4	5
10. The impact of industry structure on the company.	1	2	3	4	5

- E. If you seek specific management plans about the future (e.g. planned firm expansion, entrance into new markets, or new product research and development), that you feel are important for valuing a stock, and find that information is absent do you:

(Check all that apply)

- ☐ Ignore that information in making your decision
☐ Discount the stock value because the information is absent
☐ Use similar management plans from other firms in the same industry to infer the absent information
☐ Use the realization of similar management plans from the same firms historical data to infer the absent information.
☐ Other. Describe briefly.

- F. Your job title: _____

Number of years employed in this profession: _____

Do you specialize in a particular industry(ies)? circle: yes or no

If so: which industry(ies)? _____

Please indicate with a check mark the certification(s) you hold. Check all that apply.

- ☐ none
☐ Chartered Financial Analyst
☐ other, please list:

- G. I would appreciate an opportunity to conduct an informal half hour interview with you about investor decision-making. The interview could take place at your office or over the phone. Would you be willing to participate in such an interview?

Circle: yes or no

If so, please indicate your name and a phone number where you can be reached during business hours.

Name: _____

Phone: _____

Please return the completed survey using the self-addressed stamped envelope provided.
I appreciate your contribution to this project. Thank you.

APPENDIX B
RESEARCH INSTRUMENT

UNIVERSITY OF
FLORIDA

WARRINGTON SCHOOL OF BUSINESS
Fisher School of Accounting
Lizabeth A. Austen, CPA, CMA
PhD Candidate

267 BUS • PO Box 117166
Gainesville, FL 32611-7166
Phone (352) 392-0155
Fax: (352) 392-7962
Email: austenla@chip.cba.ufl.edu

Dear Professional Investor,

The Financial Accounting Policy Committee of the AIMR has recently released a report entitled *Financial Reporting in the 1990s and Beyond*. The report summarizes the association's position on the rules and common practices that shape corporate financial reporting; states how and why financial reports are used in the analytical process; and indicates what disclosures are essential to analysts.

I am working on a project under the direction of Professor William F. Messier, Jr. of the Fisher School of Accounting. The project deals with corporate disclosure and investor decision-making processes. I am specifically investigating how professional investors make forecasting decisions. You, as a professional investor, can provide valuable input to the project.

I invite you to participate in this project by completing the enclosed case study. You will be provided with information about several firms and asked to provide a sales forecast for one of the firms. The task will require approximately fifteen minutes of time.

I would be pleased to send a copy of the results to you upon request. When returning the study write "results requested" on the back flap of the envelope and include your return address. Case booklets and envelopes will be separated when they are received to help assure anonymity of responses.

Once you begin the experiment you may withdraw at anytime without consequence and do not have to answer any question you do not wish to answer. In reporting the results of this study, all individuals and their firms will remain confidential to the extent provided by law. Questions about the research participants' rights can be directed to the University of Florida Institutional Review Board office, PO Box 112250 University of Florida, Gainesville, FL, 32611-2550. There is no anticipated risk, immediate benefit to you, nor compensation for participation in this project. Thank you.

Sincerely,

Lizabeth A. Austen, CPA, CMA

Approved by the
University of Florida
Institutional Review Board
(IRB 02) for use through
FEB 07 1998

INTRODUCTION

In 1994 in response to a perceived need by investors and creditors for additional information disclosure, the Special Committee on Financial Reporting of the AICPA released a report entitled *Improving Business Reporting-A Customer Focus: Meeting the Needs of Investors and Creditors*. The report recommends that reporting entities prepare a separate section of the annual report for the reporting of forward-looking information.

Forward-looking information includes disclosure of opportunities and risks, including those resulting from key trends. Opportunities and risks are characterized as material trends, demands, commitments, concentrations, and events, including legal proceedings, known to management that would cause reported financial information not to be necessarily indicative of future core earnings, net income, cash flows, or of future financial conditions.

The case will provide you with information taken from the 19x8 annual financial report of The Forestking Paper Company. The information provided in each case should be used to estimate Forestking's pulp and paper sales for fiscal 19x9.

You should analyze the firm and provide forecasts as you would do in the normal course of business. Although you will not have all of the information available that you would typically have at your disposal in your office, it is important that you perform your financial analysis to the best of your abilities given the limited information set.

There is no single correct answer and it is not necessary that you be familiar with this particular industry to complete this experimental case. Since this project is concerned with individual judgments, it is important that you work independently. Please feel free to write notes or make marks on the case materials.

CASE STUDY: INVESTOR Decision-making

FORESTKING PAPER COMPANY

Forestking Paper Company has not adopted the AICPA Special Committee on Financial Reporting recommendations to disclose forward-looking information. *Pulpmaster* and *Paperland* are both competitors of Forestking within the paper and forest products industry and have elected to phase-in disclosure of forward-looking information on a segment by segment basis, beginning with their paper and pulp segment. That information follows:

PULPMASTER PAPER COMPANY: Opportunities and Risks Including Those Resulting from Key Trends: Pulp Sales

Growth in Unit Sales for Pulp. Sales of market pulp comprise approximately 25% of sales within the paper and pulp segment. We expect continued growth in worldwide demand for pulp—roughly at a rate of about 1% in each of the next three years. A primary opportunity from the growth in unit sales trend is that higher unit sales, even at somewhat lower margins, means higher total margin dollars and core earnings. We see little risk that we will lose market share to competitors in 19x9.

Falling prices. Average prices for pulp increased significantly from 19x7 levels to an average of \$873 per metric ton (NBSK pulp) in 19x8, reaching a peak of \$925 per metric ton by year end. Over the next three years, we expect that average prices will decline at a moderate rate of 2 percent to 5 percent per year. Prices could fall faster than the moderate rate we expect. Falling prices offer both an opportunity and a risk for the segment. Falling prices help fuel the growth in unit volume. However, falling prices may reduce the gross margin we earn from the sales of our product.

PAPERLAND PAPER COMPANY: Opportunities and Risks Including Those Resulting from Key Trends: Pulp Sales

Growth in Unit Sales for Pulp. Sales of market pulp comprise approximately 25% of sales within the paper and pulp segment. We expect continued growth in worldwide demand for pulp--roughly at a rate of about 1% in each of the next three years. A primary opportunity from the growth in unit sales trend is that higher unit volume means less pressure on prices than would otherwise occur. We see little risk that we will lose market share to competitors in 19x9.

Falling prices. Average prices for pulp increased significantly from 19x7 levels to an average of \$873 per metric ton (NBSK pulp) in 19x8, reaching a peak of \$925 per metric ton by year end. Over the next three years, we expect that average prices will decline at a moderate rate of 2 percent to 5 percent per year. Prices could fall faster than the moderate rate we expect. Falling prices offer both an opportunity and a risk for the segment. Falling prices help fuel the growth in unit volume. However, falling prices may reduce the gross margin we earn from the sales of our product.

Pulpmaster and Paperland are both approximately the same size company as *Forestking*. A comparison of pulp and paper sales for *Forestking*, *Pulpmaster* and *Paperland* follows:

**See Table 4 for example of table and graph that was placed here.

Please provide an estimate of fiscal 19x9 pulp and paper sales for Forestking Paper Company (\$ in millions)

\$ _____

How confident are you (on a scale of 0-100) that your prediction is within 10% of actual 19x9 pulp and paper sales?

_____ % confident

Briefly describe the decision-making process that you used to predict 19x9 pulp and paper sales for Forestking Paper Company.

Please answer the following questions:

1. Irrespective of the information given (not given) in the previous cases, when making predictions of future sales, what single piece of information would you consider most important?

2. In examining the case materials, did you consider Forestking Paper Company's management's reason for not disclosing forward-looking information? (please circle one)

yes
no

- 2a. if yes, what did you believe was the reason Forestking Paper Company's management did not disclose the information.

- 2b. if no, please continue.

3. As a part of your employment do you predict future financial data (i.e. sales, earnings, etc.)?
(please circle one)

yes
no

4. How often do you seek forward-looking information as part of your employment? (please circle one)

Frequently
Occasionally
Rarely

5. When you seek forward-looking information, how available is it to you? (please circle one)

Always Available	Usually Available	Sometimes Available	Rarely Available	Never Available	Do not Seek
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6. How important is forward-looking information to you? (please circle one)

Very
Important
Important
Somewhat
Important
Somewhat
Unimportant
Unimportant

7. If you sought forward-looking information that you felt was important for predicting future financial data, and found that information was absent would you: (check all that apply)

☐ Ignore that information in making your prediction
☐ Use similar information from other firms within the industry to infer the information
☐ Use the firm's historical data to infer the absent information
☐ Seek other information such as (describe)
☐ Other (describe briefly)

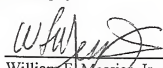
8. Your job title: _____

9. If you specialize in a particular industry, please indicate that industry below. Otherwise indicate "none"

BIOGRAPHICAL SKETCH

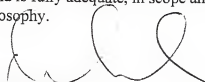
Lizabeth Anne Austen was born in Waukesha, Wisconsin in 1953. She is a 1975 graduate of the University of Wisconsin with a bachelor's degree in mathematics education. In 1986 she earned a master's degree in accounting from the University of Wisconsin-Whitewater. She became a certified public accountant in 1988 and a certified management accountant in 1990. She has worked in public accounting as a staff accountant for McGladrey and Pullen in Rocky Mount, North Carolina. Her teaching experience includes teaching mathematics at the University of Wisconsin-Whitewater and accounting at Nash and Sante Fe Community Colleges, North Carolina Wesleyan College, The University of Florida, The University of New South Wales, and Embry-Riddle Aeronautical University.

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.



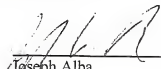
William F. Messier, Jr., Chairman
Professor of Accounting

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.



Karl Hackenbrack
Associate Professor of Accounting

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.



Joseph Alba
Professor of Marketing

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.



John G. Lynch
Graduate Research Professor of Marketing

This dissertation was submitted to the Graduate Faculty of the Department of Accounting in the College of Business Administration and to the Graduate School and was accepted as partial fulfillment of the requirements for the degree of Doctor of Philosophy.

December 1997

Dean, Graduate School